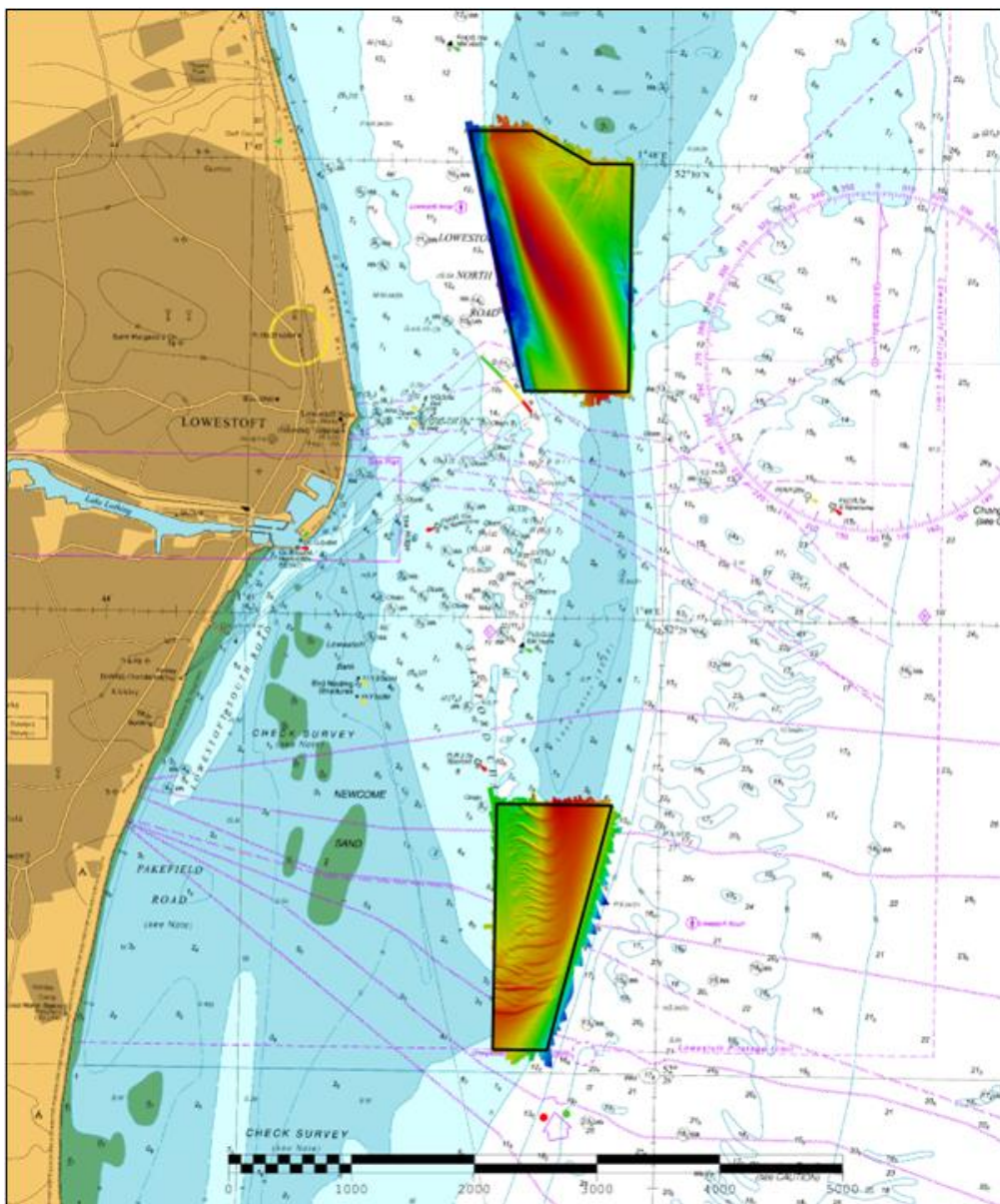




UK Hydrographic
Office

EAST ANGLIA APPROACHES TO LOWESTOFT (EA10A +EA10C) 2023 ASSESSMENT

An assessment of the 2023 hydrographic survey of the areas EA10A and EA10C: to monitor recent seabed movement; to identify any implications for shipping; and to make recommendations for future surveys.



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Notes

This Assessment is produced by the UK Hydrographic Office (UKHO) for the Maritime and Coastguard Agency (MCA). Analysis of the Routine Resurvey Areas forms part of the Civil Hydrography Programme and the reports are made available through the UKHO website and are presented to the Civil Hydrography Working Group. When approved, the recommendations are incorporated into the Routine Resurvey Programme. The report is governed by a Memorandum of Understanding between the DfT (including the MCA) and the MOD (including the UKHO).

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No analysis of shipping traffic has been included within this report due to no AIS data being supplied by MCA.

All depths are to Chart Datum, defined using the UKHO Vertical Offshore Reference Frame (VORF) Model.

APPROACHES TO LOWESTOFT, 2023

1. SUMMARY

Changes Detected

- 1.1 In EA10A Newcome Sand continues its eastward migration into Stanford Channel, with the controlling depth at the centre of the entrance to the channel decreasing from 4.7m in 2022 to 4m in 2023.
- 1.2 In EA10C, Holm Sand continues its westerly migration into Lowestoft North Road, with the 5m contour moving approximately 90m to the west since 2022.

Reasons for Continuing to Resurvey the Area

- 1.3 Depths in the area remain mobile and potentially hazardous to vessels navigating the Lowestoft area and therefore require continued monitoring through 3-year full surveys and 1-year focused surveys.

Recommendations

- 1.4 EA10A adequately covers the area of mobile sandwaves at the entrance to the Stanford Channel so no revision is required.
- 1.5 EA10C is no longer centred on the mobile sandbank, so requires the northern boundary to be extended to the west by 540m. The same revision will be required for the 3-year full survey EA10.

2. LOCATION

- 2.1 Survey interval at time of resurvey: 1 year focused areas, 3 years full area

- 2.2 Area Covered:

Focused area EA10A: 1.38 km²

Focused area EA10C: 2.16 km²

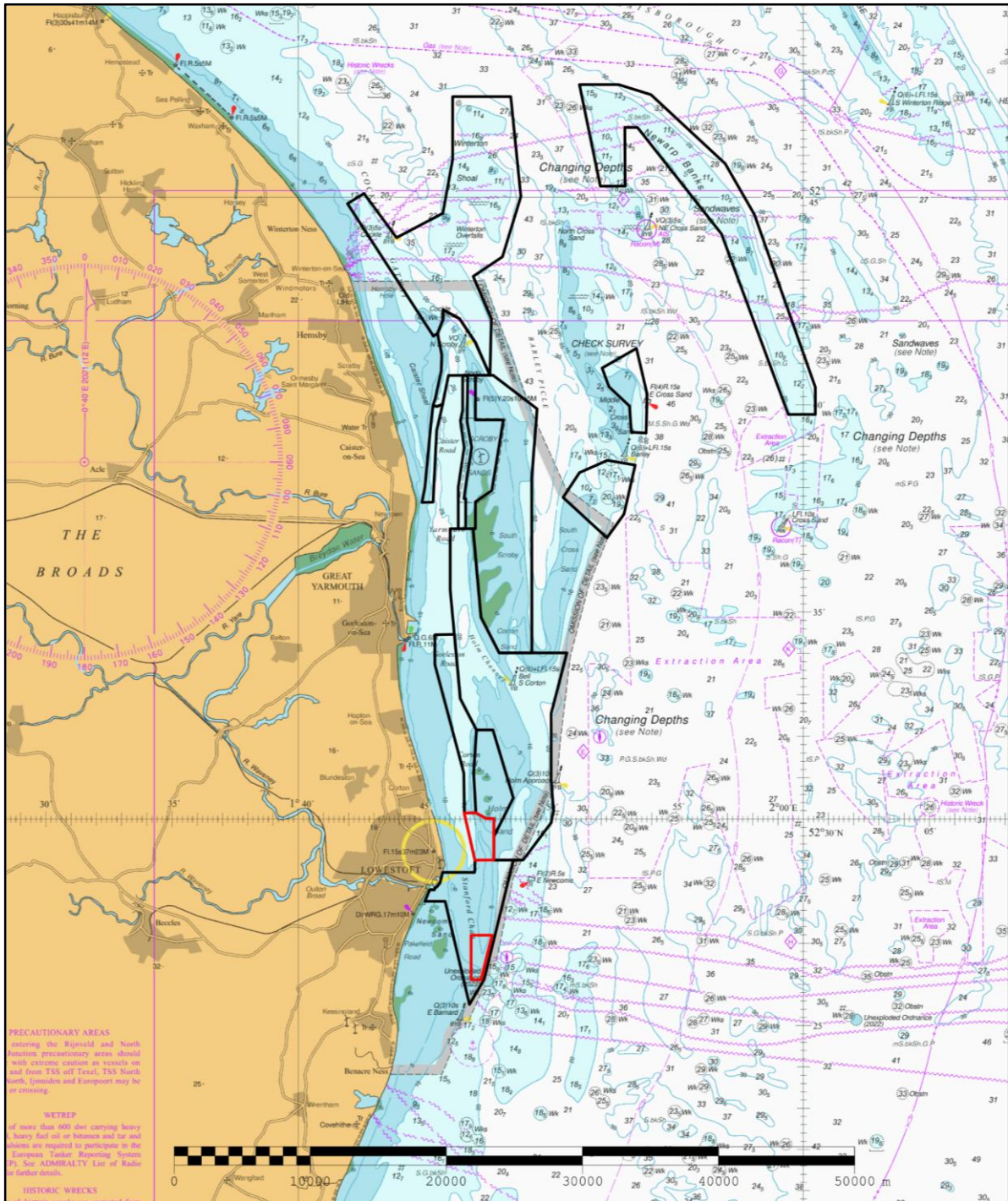


Figure 1: 2023 East Anglia Routine Resurvey areas overlaid on BA Chart 1504-0 with areas EA10A and EA10C in red

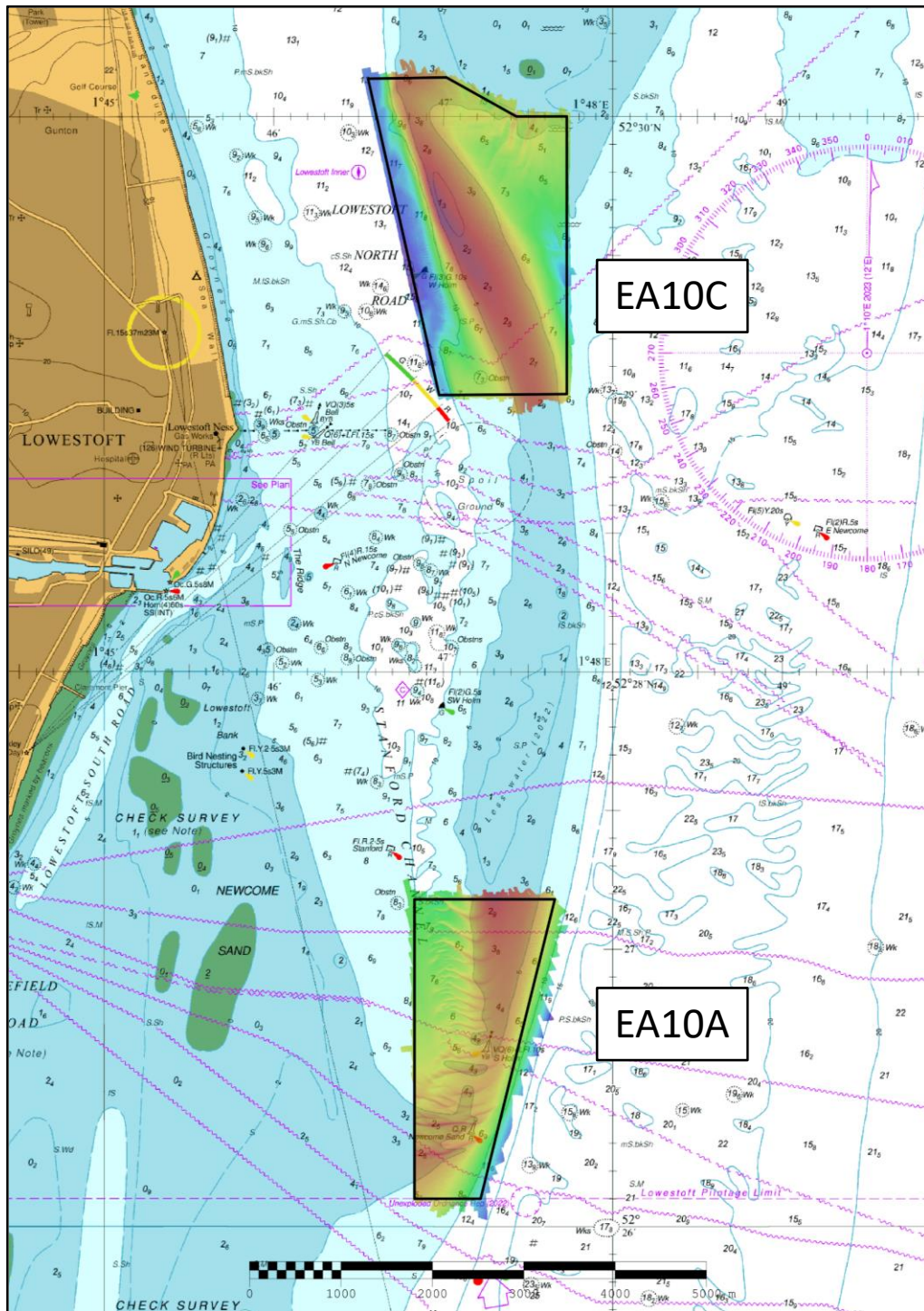


Figure 2: 2023 survey data overlaid on BA Chart 1535-0

3. REFERENCE SURVEY DETAIL

- 3.1 A full survey was conducted as part of the 2022 Routine Resurvey Programme in October 2022 as part of HI1762. The previous focused surveys were conducted as part of the 2021 Routine Resurvey Programme in October 2021 as part of HI1738; areas EA10A, EA10B and EA10C.
- 3.2 The Report of Survey for this survey is available upon request from the UKHO and the validated bathymetric surfaces are available to download from the Admiralty Marine Data Portal.

4. NEW SURVEY DETAIL

- 4.1 Focused survey areas E10A and EA10C were surveyed in September 2023 as part of HI1829.
- 4.2 The Report of Survey for this survey is available upon request from the UKHO and the validated bathymetric surfaces are available to download from the Admiralty Marine Data Portal.

5. DESCRIPTION OF RECENT BATHYMETRIC CHANGE

- 5.1 The depth plot in Figure 3 shows the controlling depths in EA10A. The entrance to Stanford Channel (between the Newcome Sand buoy and the S Holm buoy), the most likely navigable route into Lowestoft from the south, now has a controlling depth of 4m, which is situated on the peak of a sandwave in the centre of the buoyed entrance to the channel. In 2022 this sandwave was recorded at 4.7m, and in 2021 controlling depth in the middle of the channel was 5.4m, so it has shoaled by 0.7m both years. There is a second significant sandwave approximately 250m to the south with a controlling depth of 4.2m.
- 5.2 The difference surface in Figure 5 shows migration of sandwaves in EA10A. In the northwest of the area the sandwaves are migrating south and have moved by 20-50m since 2022. To the south of EA10A the sandwaves are moving in an ENE direction. This can also be seen in Figure 7, which shows movement of the 5m contour. In 2022 the distance between the 5m contour of the central sandbank and the 5m contour of the southern sandbank was approximately 500m, in 2023 the gap between the 5m contours has decreased to around 200m and there are now multiple sandwaves shoaler than 5m in the middle of the channel entrance.
- 5.3 In general, in EA10A the depth changes are due to sandwave migration in the west and centre of the area, to the east and far south there is less navigationally significant change, as seen in green and yellow in Figure 5.
- 5.4 The depth plot in Figure 4 shows significant depths in EA10C, the least depth is 1.4m, with another significant depth of 1.8m approximately 520m to the southeast. The sand bank in general has become shoaler, as can be seen in Figure 8, where the area shoaler than 2m has more than doubled in size since 2022. In the 2021 survey of EA10C there was a gap in the 5m contour to the north of the area, which had closed by 2022 and has become shoaler again in 2023, indicating that the sandbank is moving northwest. The area where the gap in the 5m contour was in 2021 now has a controlling depth of 3.2m.
- 5.5 Figures 9a and 9b show movement of the 5m and 10m contours in EA10C which have both moved west by approximately 90m since 2022. This is also highlighted in the difference surface in Figure 6 which shows significant shoaling of the sandbank, and deepening in the east of the area, indicating that the sandbank is moving west.
- 5.6 Figures 10 and 11 show colour banded sounding selections of the 2023 survey areas. In EA10A (Figure 10) the shoaling depths to the west are due to sandwave migration, whereas the changes to the east are less drastic as the sandwaves have a lower amplitude. In EA10C the greatest differences are to the west where the sandbank is shoaling, and the deepening to the northeast, as previously seen in the difference surface in Figure 6.

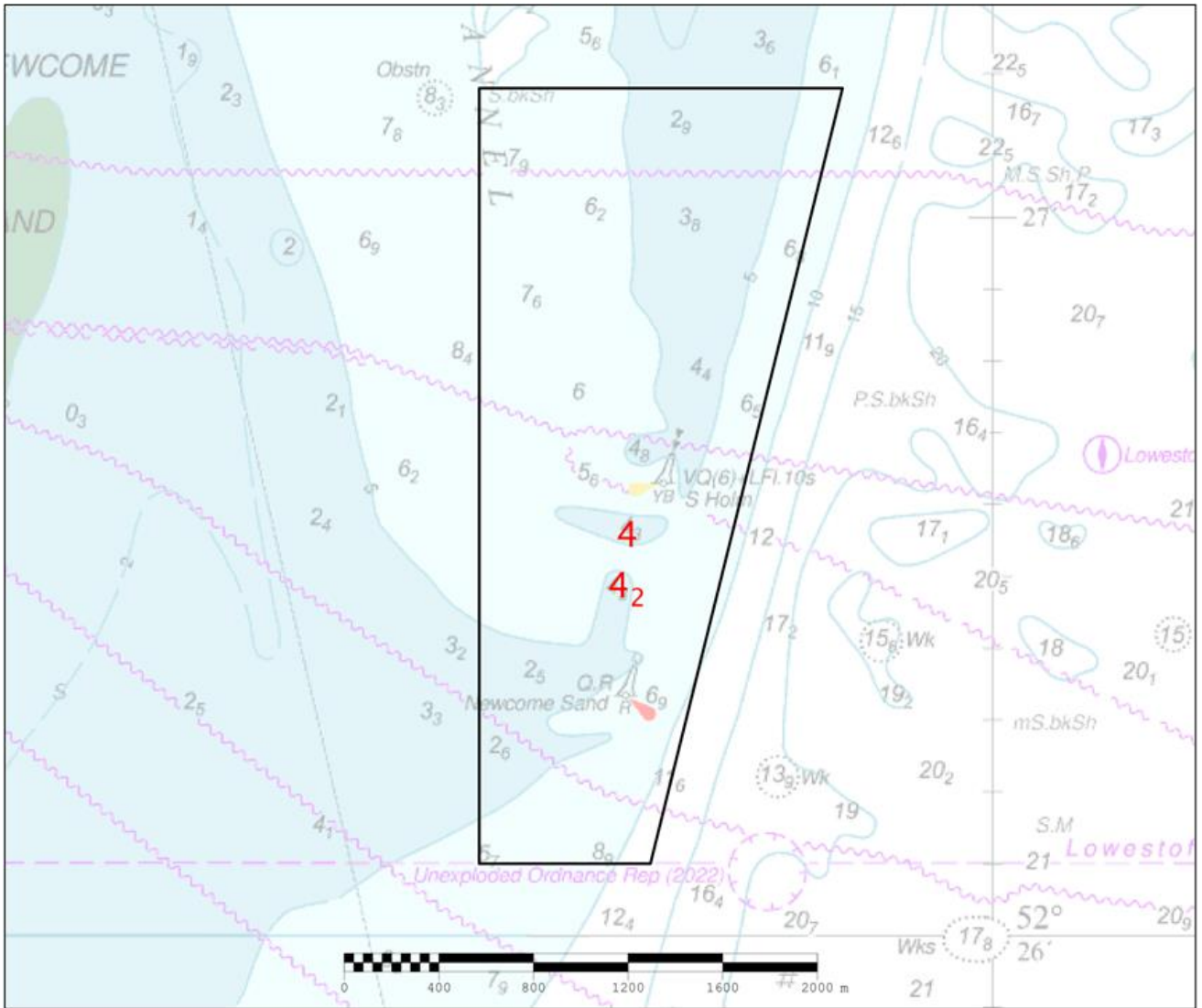


Figure 3: Controlling Depth soundings for EA10A highlighted, overlaid on BA Chart 1535-0

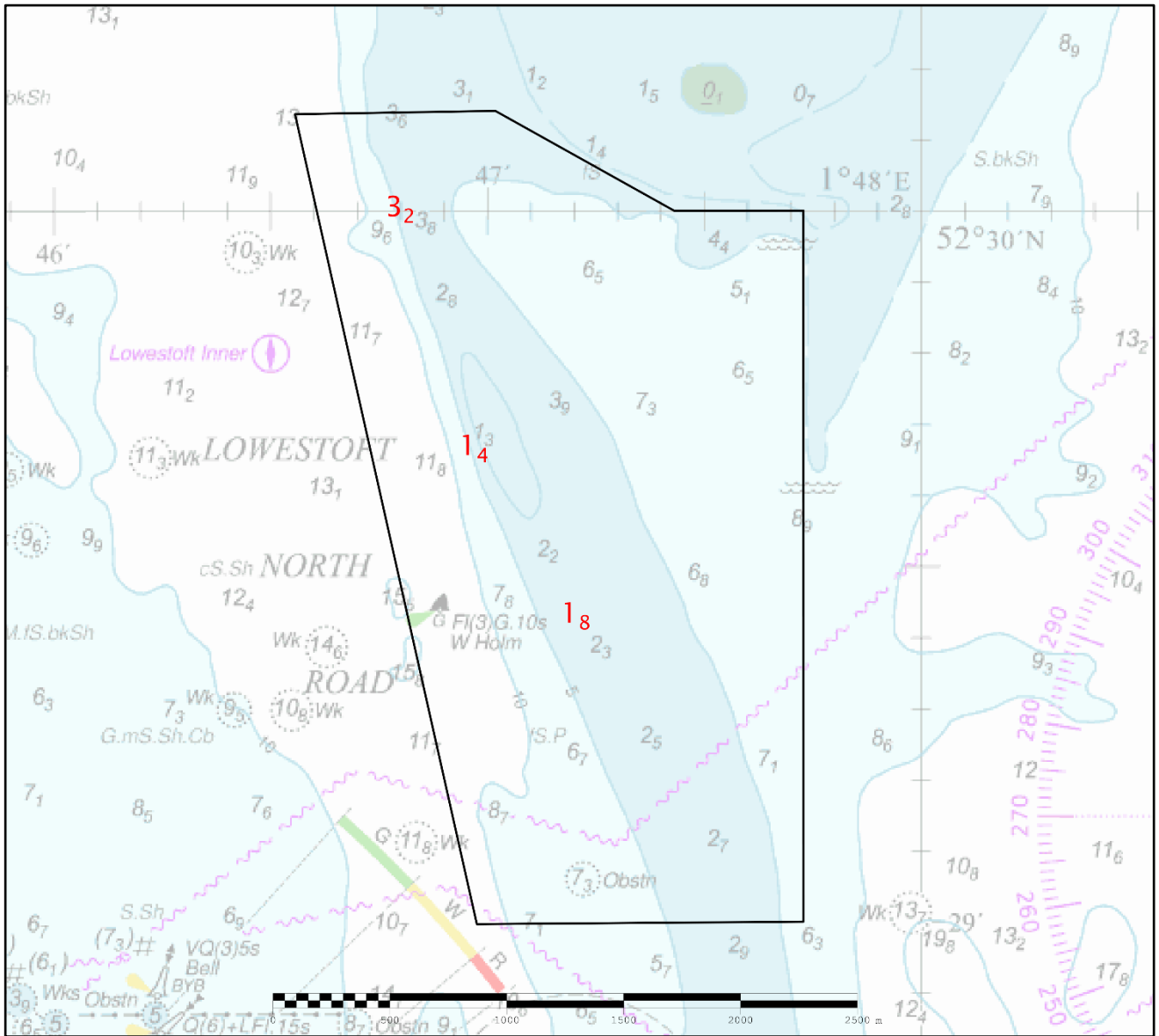


Figure 4: Controlling Depth soundings for EA10C highlighted, overlaid on BA Chart 1535-0

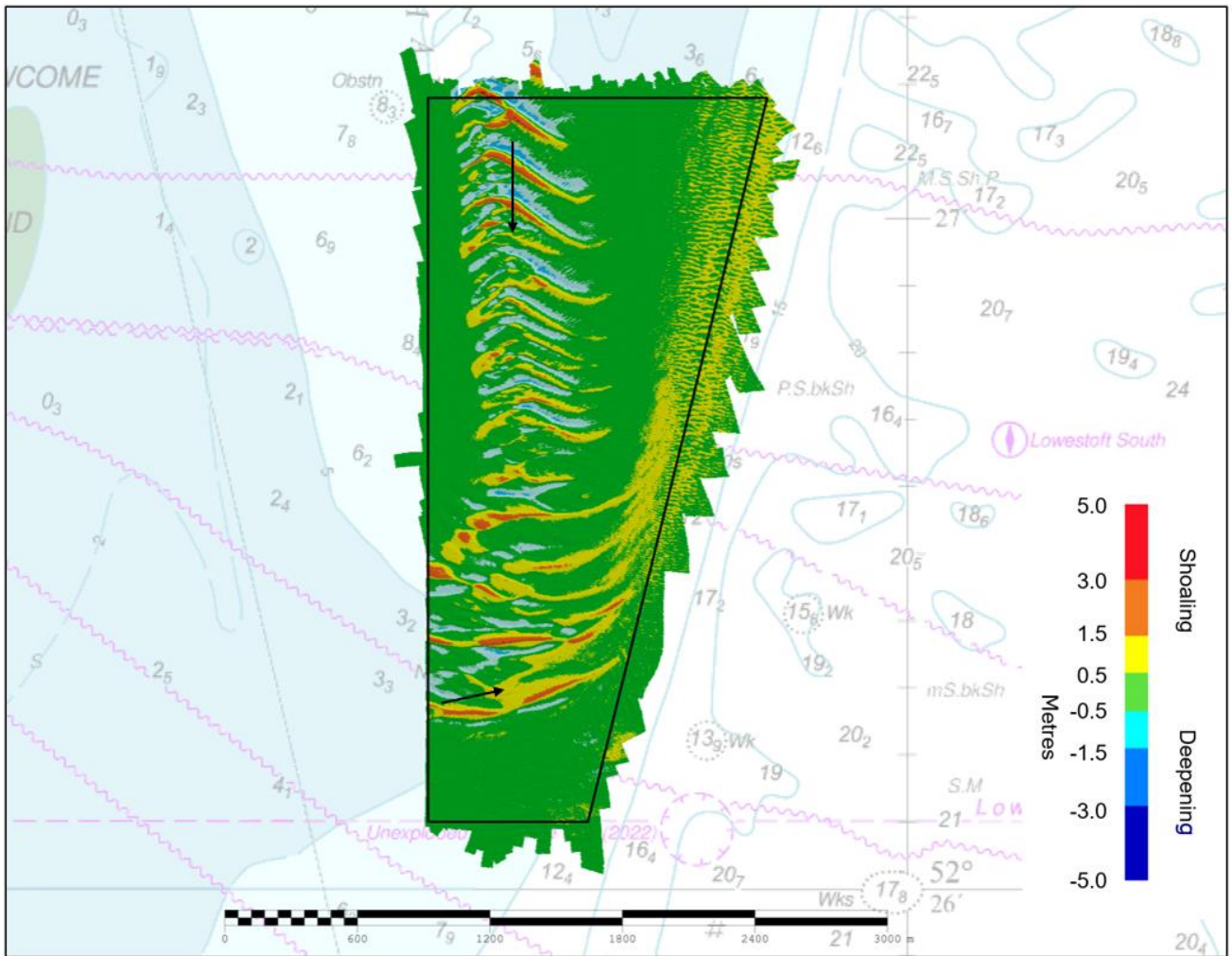


Figure 5: Difference surface showing bathymetric changes between the 2022 and 2023 surveys overlaid on BA Chart 1535-0 (Black arrows represent sandwave migration since 2022 survey)

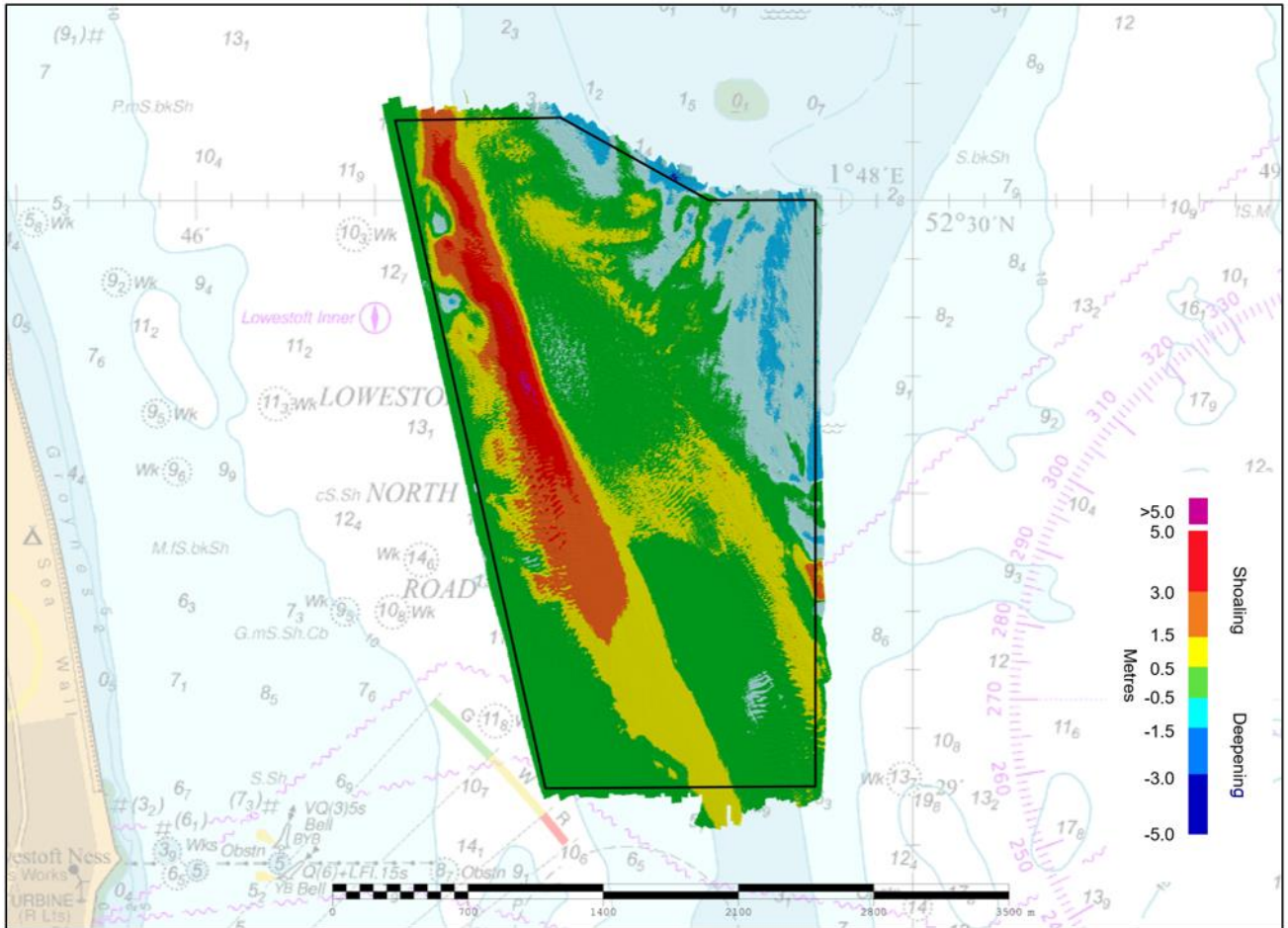


Figure 6: Difference surface showing bathymetric changes between the 2022 and 2023 surveys overlaid on BA Chart 1535-0

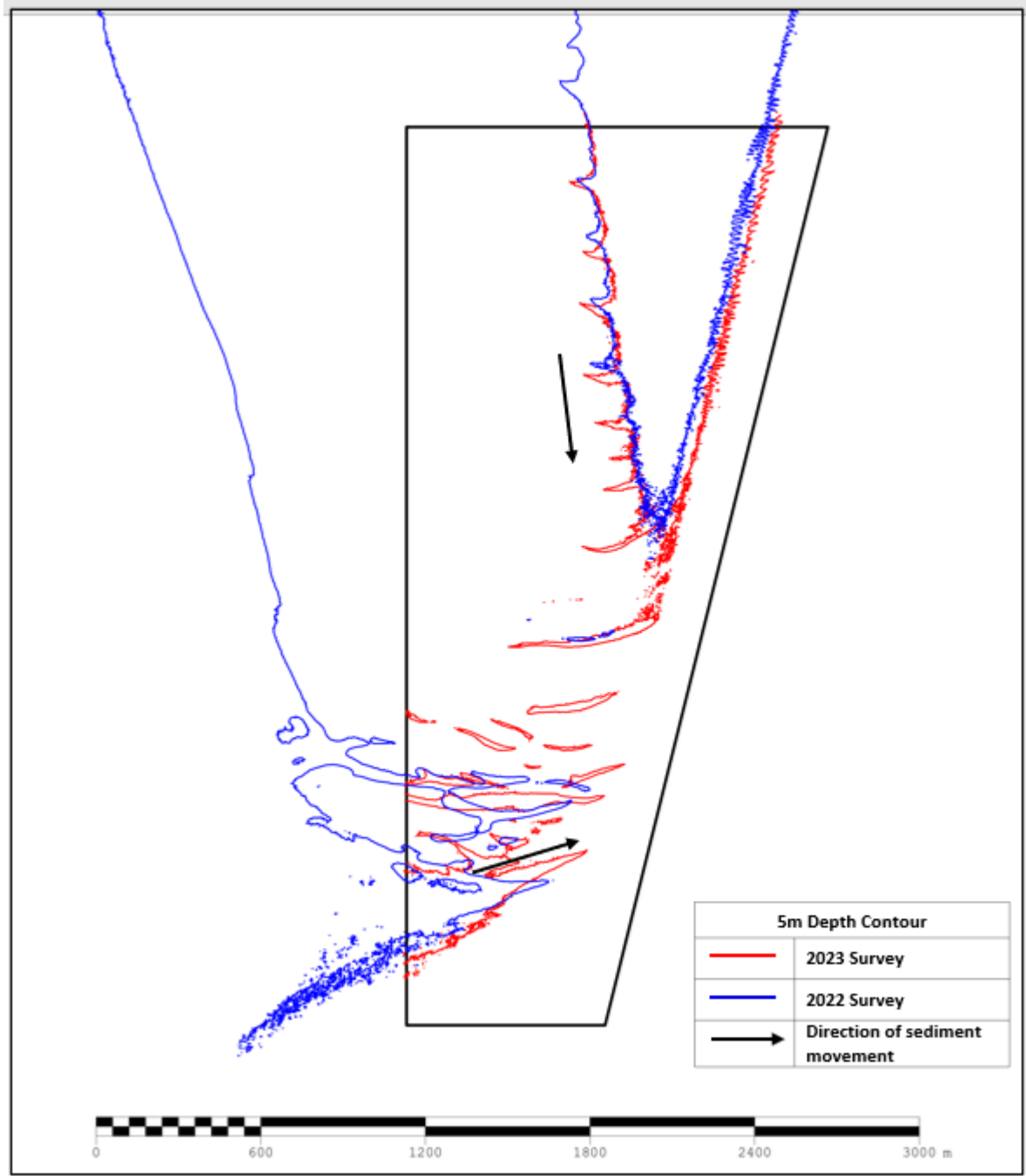


Figure 7: Contour plot showing changes in the 5m contours between 2022 (blue) and 2023 (red). Black arrow represents feature migration.

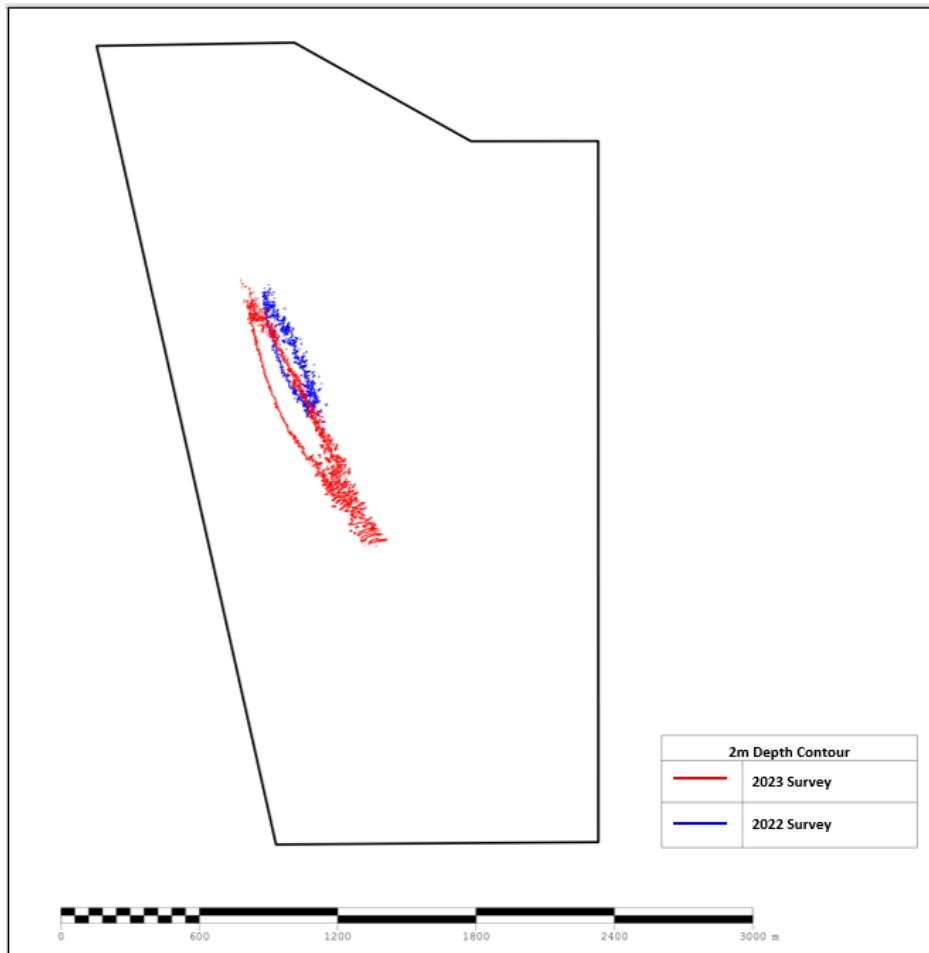


Figure 8: Contour plot showing changes in the 2m contours between 2022 (blue) and 2023 (red).

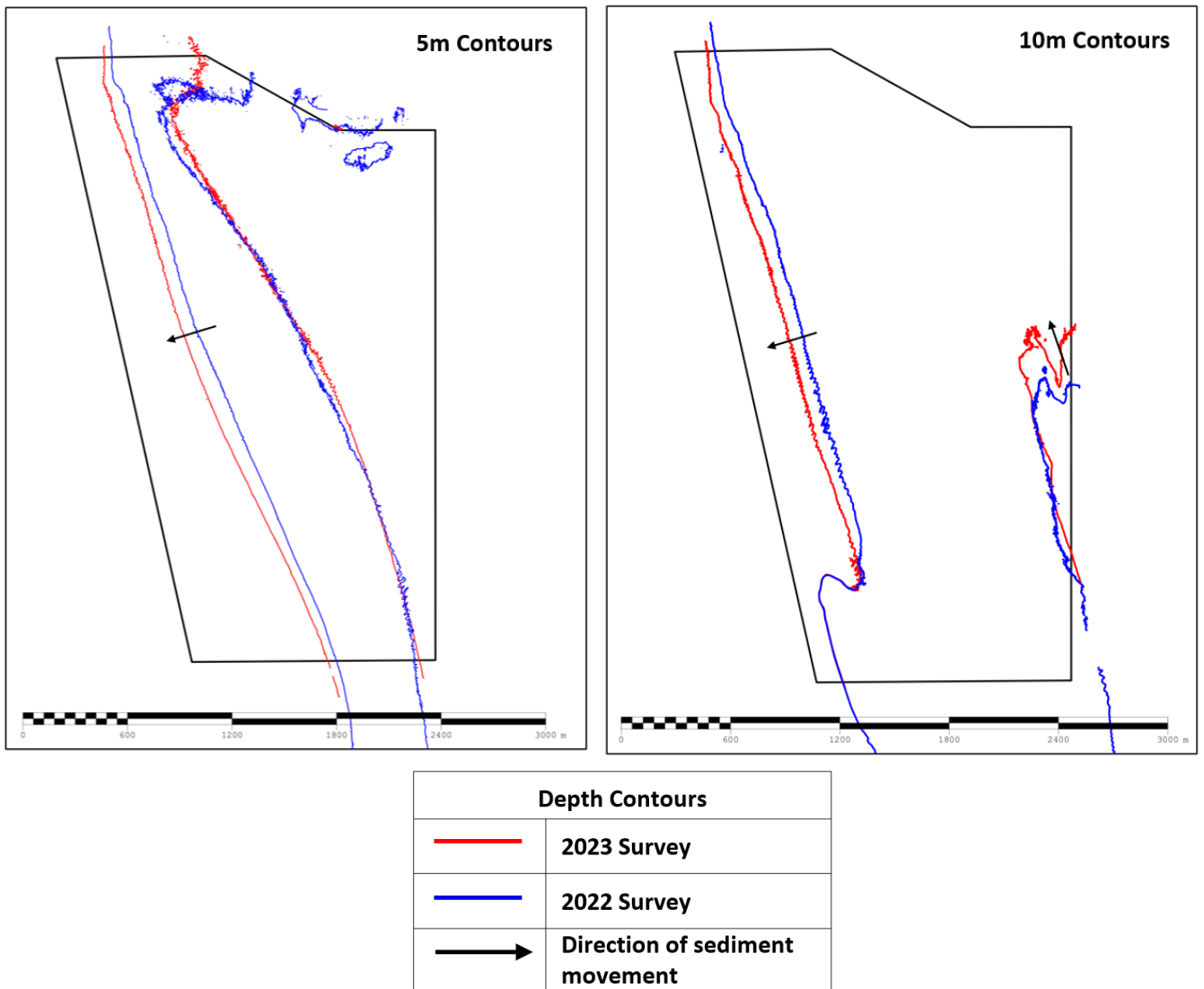


Figure 9a and 9b: Contour plot showing changes in the 5m and 10m contours between 2022 (blue) and 2023 (red). Black arrow represents feature migration.

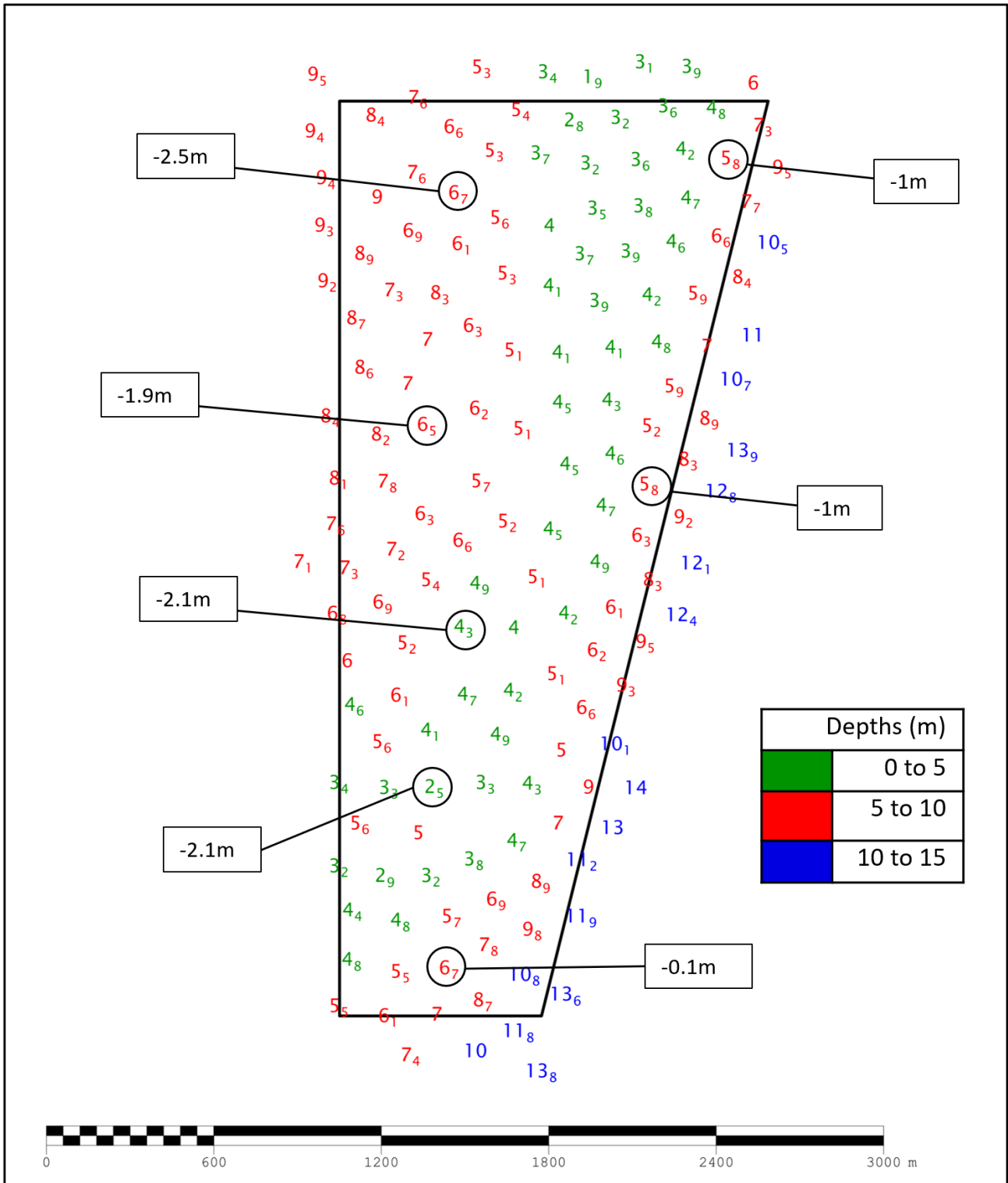


Figure 10: Colour banded depth plot from the 2023 survey with selected depth changes since the 2022 survey. Positive values (+) represent deepening. Negative values (-) represent shoaling. Note: Large differences in the west of the area are due to sandwave migration.

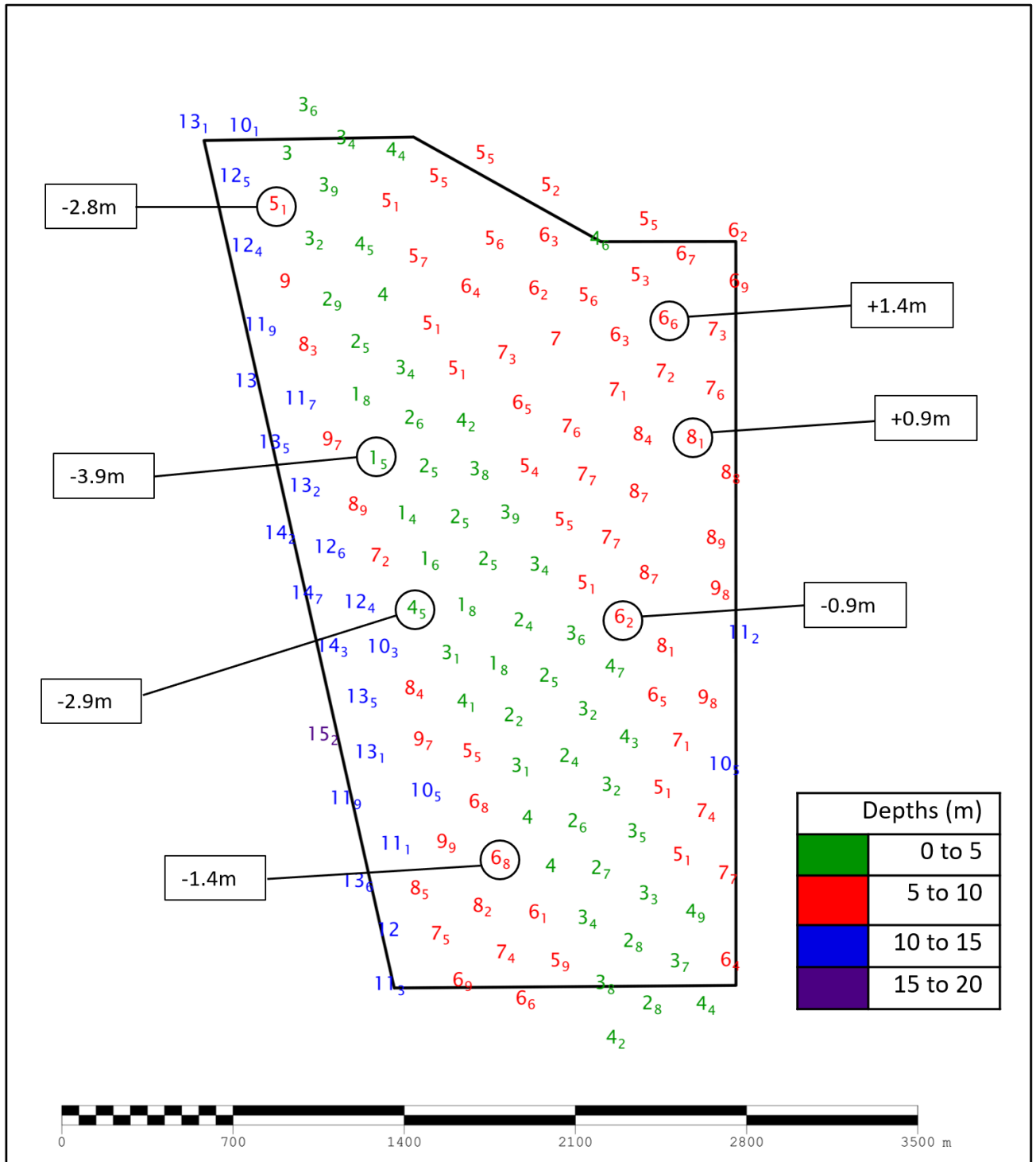


Figure 11: Colour banded depth plot from the 2023 survey with selected depth changes since the 2022 survey. Positive values (+) represent deepening. Negative values (-) represent shoaling. Note: Large differences in the west of the area are due to movement of the sandbank.

6. RECOMMENDATIONS FOR FUTURE SURVEYS

Survey Interval

- 6.1 Given the changing depths due to continued migration of sandwaves in EA10A and the movement and shoaling of the sandbank in EA10C both these focused areas should remain on the annual survey schedule.

Survey Area

- 6.2 The focused area EA10A sufficiently covers the migrating sandwaves around the entrance to the Stanford Channel so no adjustments are needed.
- 6.3 Focused area EA10C needs adjusting to ensure movement of the sandbar is captured in next year's survey. The area needs to be extended to the west, but can be reduced in the northeast where it is deepening, as seen in Figure 12 below. The northern boundary of the area should be extended west by 540m, and reduced in the east by 550m. The same change will need to be made to the full EA10 area, see Figure 13.
- 6.4 In survey area EA8A, which is to the North of EA10C, there were significant changing depths along the western edge of Holm Sand, extension of EA10C north should therefore be considered depending on the development of a >5m depth channel in this vicinity.

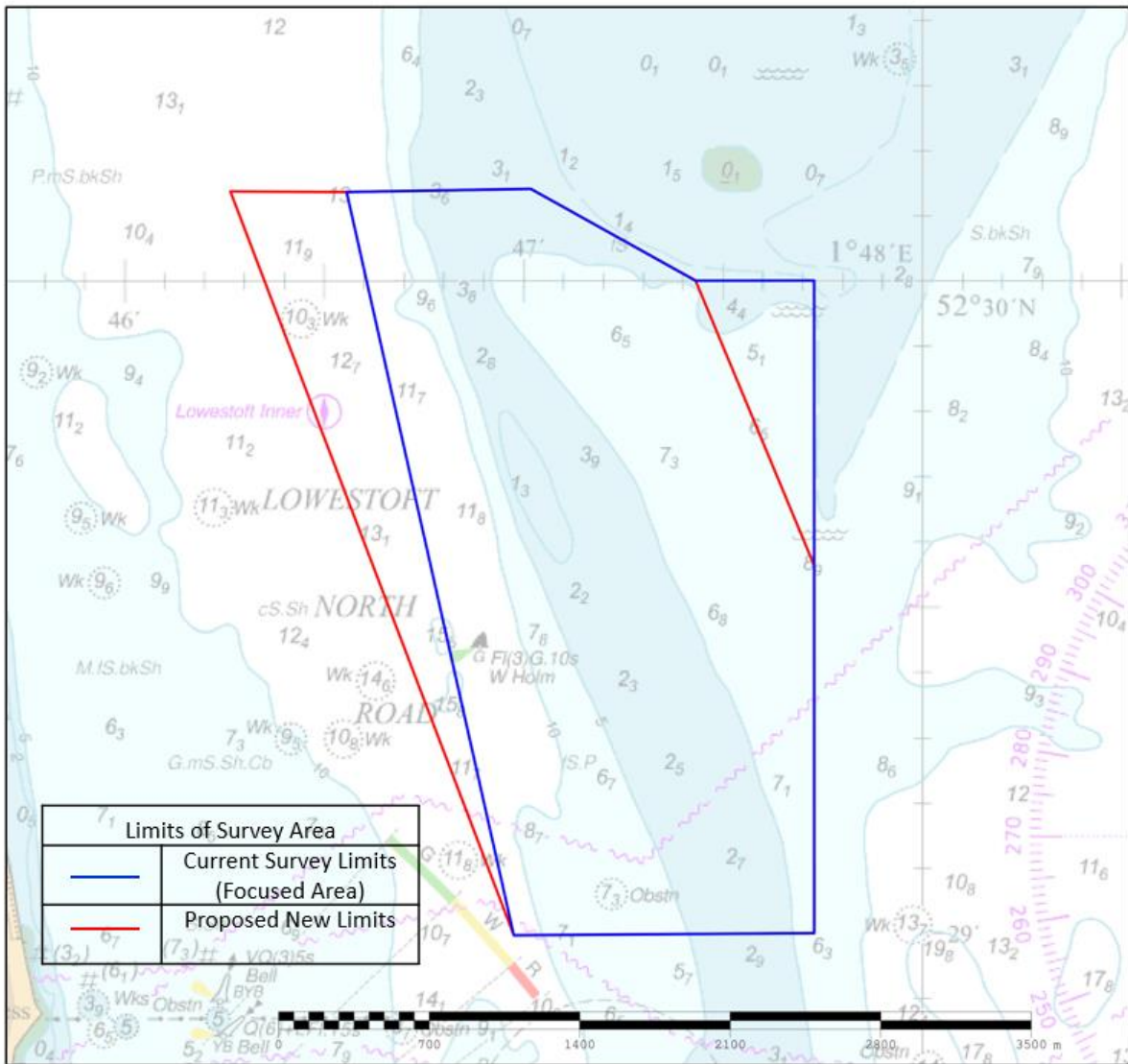


Figure 12: Recommended changes to survey limits of area EA10C

The coordinates of the recommended adjusted survey area limits for the 1-year focused area EA10C are shown below:

EA10C total area: 2.37 km²

	Latitude	Longitude
1	52-30.1373	001-46.5626
2	52-30.1382	001-47.0183
3	52-30.0000	001-47.4309
4	52-29.5647	001-47.7300
5	52-28.9998	001-47.7300
6	52-28.9974	001-46.9752
7	52-30.1374	001-46.2647

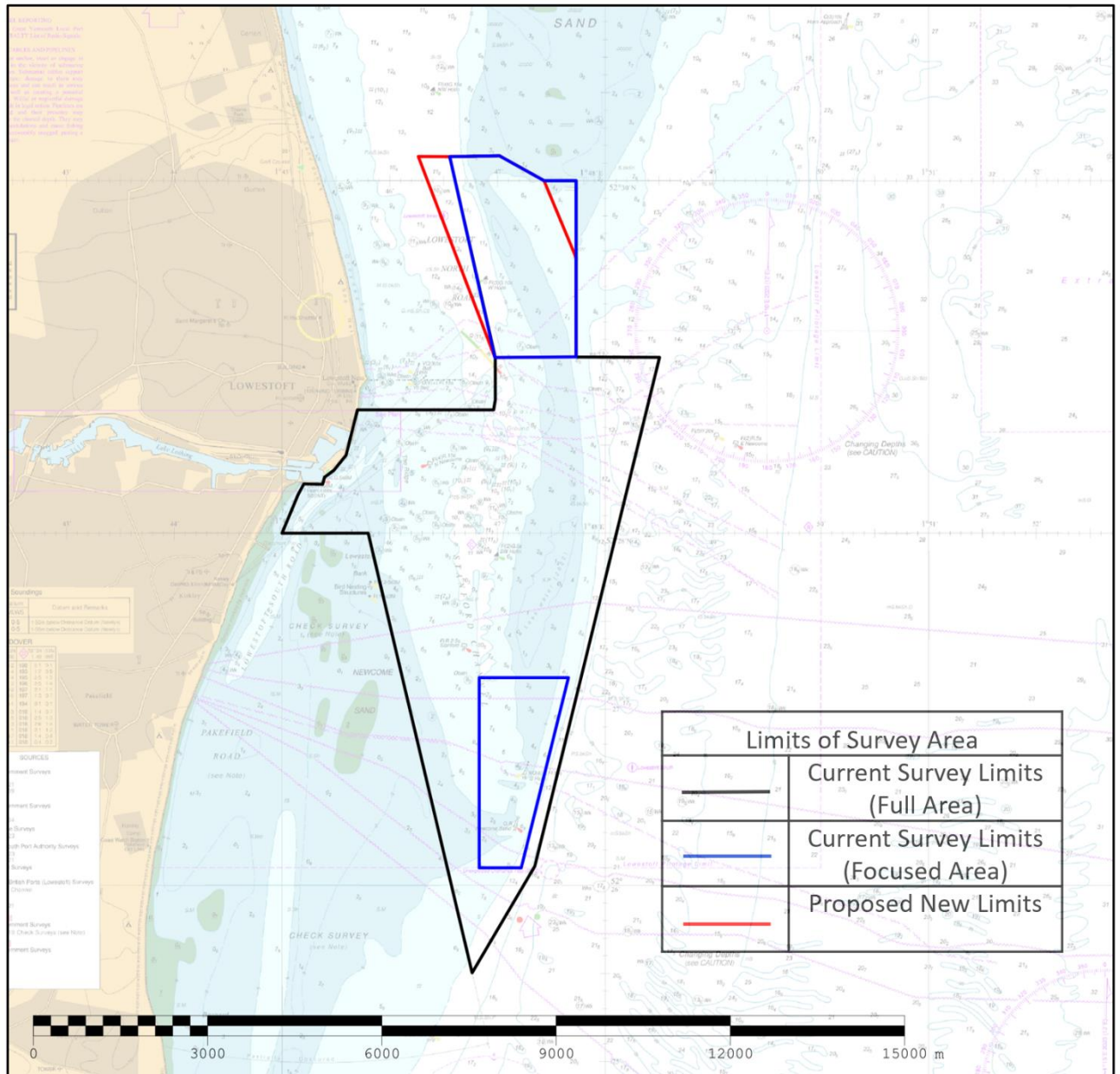


Figure 13: Recommended changes to survey limits of area EA10

The coordinates of the recommended adjusted survey area limits for the 3-year full area EA10 are shown below:

EA10 total area: 14.20 km²

	Latitude	Longitude
1	52-28.999800N	001-47.730000E
2	52-28.998084N	001-48.502950E
3	52-26.109168N	001-47.345748E
4	52-25.503372N	001-46.764132E
5	52-28.000200N	001-45.799800E
6	52-28.000002N	001-45.000000E
7	52-28.219800N	001-45.150000E
8	52-28.279800N	001-45.202500E

9	52-28.277700N	001-45.376500E
10	52-28.317600N	001-45.394800E
11	52-28.356750N	001-45.480732E
12	52-28.442520N	001-45.594342E
13	52-28.699998N	001-45.700002E
14	52-28.699902N	001-46.963626E
15	52-28.756356N	001-46.979436E
16	52-28.996728N	001-46.978764E
17	52-30.137496N	001-46.264716E
18	52-30.137298N	001-46.562598E
19	52-30.138198N	001-47.018298E
20	52-30.000000N	001-47.430960E
21	52-29.564700N	001-47.730000E